Comparison of Io Torus Plasma Densities Observed by Galileo with Previous in Situ and Remote Measurements

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The measurements of electron density made by the PWS and PLS instruments on Galileo during its pass through the torus on December 7th, 1995 are compared with a model based on Voyager 1 measurements made in March 1979. Outside Io's orbit the plasma densities observed by Galileo are approximately a factor of two higher than the Voyager values. These higher densities are consistent with higher emission intensities observed by the Galileo UVS instrument (though detailed comparison depends on the electron temperature). Inside Io's orbit the Galileo density profile dropped sharply and remained at low values. This suggests that the 'ribbon' region which is usually observed in ground-based images of the torus was either absent or much farther from Jupiter than usual.

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